

Amendment to the Claims

1. (Currently Amended) A motor driving apparatus for driving a motor, said motor driving apparatus comprising:

a rectifier circuit having an input to be connected to a single-phase AC power supply;

an inverter circuit connected to said rectifier circuit, said inverter circuit being operable to output a current and a voltage to the motor; and

an inverter control unit operable to control said inverter circuit so as to drive the motor;

wherein said inverter control unit includes a power supply voltage estimation unit operable to estimate a voltage of the single-phase AC power supply, and said inverter control unit is operable to change the value of the current or voltage outputted from said inverter circuit so that a waveform of an input voltage of said inverter circuit which is outputted from said rectifier circuit to said inverter circuit becomes equal or approximate to an absolute value of a waveform of an output voltage of the single-phase an AC power supply, based on the power supply voltage estimated by said power supply voltage estimation unit.

2. (Previously Presented) A motor driving apparatus as defined in Claim 1, wherein:

said inverter control unit is operable to perform at least one of a first control and a second control;

the first control is said inverter control unit decreasing the value of the output current or output voltage of said inverter circuit when the power supply voltage estimated by said power supply voltage estimation unit is changing from a zero voltage to a peak voltage; and

the second control is said inverter control unit increasing the value of the output current or output voltage of said inverter circuit when the power supply voltage

estimated by said power supply voltage estimation unit is changing from the peak voltage to the zero voltage.

3. (Previously Presented) A motor driving apparatus as defined in Claim 1, wherein:

said power supply voltage estimation unit has a zerocross detection unit for detecting a zerocross timing of the single-phase AC power supply; and

said power supply voltage estimation unit is operable to estimate a voltage of the single-phase AC power supply from the zerocross timing detected by said zerocross detection unit.

4. (Previously Presented) A motor driving apparatus as defined in Claim 1, wherein:

said inverter control unit has an inverter input voltage detection unit for detecting the voltage inputted to said inverter circuit;

said inverter control unit is operable to

compare the absolute value of the power supply voltage estimated by said power supply voltage estimation unit with the inverter input voltage detected by said inverter input voltage detection unit, and

perform at least one of a first control and a second control;

the first control is said inverter control unit increasing the value of the output current or output voltage of said inverter circuit when the inverter input voltage detected by said inverter input voltage detection unit is higher than an absolute value of the power supply voltage estimated by said power supply voltage estimation unit; and

the second control is said inverter control unit decreasing the value of the output current or output voltage of said inverter circuit when the inverter input voltage detected by said inverter input voltage detection unit is lower than the absolute value of the power supply voltage estimated by said power supply voltage estimation unit.

5. (Previously Presented) A motor driving apparatus as defined in Claim 4,
wherein: the motor is a DC brushless motor;
the first control is said inverter control unit advancing the phase of the output current or output voltage of said inverter circuit to increase the value of the output current or output voltage of said inverter circuit; and
the second control is said inverter control unit delaying the phase of the output current or output voltage of said inverter circuit to decrease the value of the output current or output voltage of said inverter circuit.
6. (Previously Presented) A motor driving apparatus as defined in Claim 4,
wherein: the motor is an induction motor;
the first control is said inverter control unit decreasing the angular velocity of the output current or output voltage of said inverter circuit to increase the value of the output current or output voltage of said inverter circuit; and
the second control is said inverter control unit increasing the angular velocity of the output current or output voltage of said inverter circuit to decrease the value of the output current or output voltage of said inverter circuit.
7. (Previously Presented) A motor driving apparatus as defined in Claim 4,
wherein:
said power supply voltage estimation unit includes a timing detection unit for detecting a timing at which the inverter input voltage attains a maximum value, based on the inverter input voltage detected by said inverter input voltage detection unit; and
said power supply voltage estimation unit is operable to estimate a voltage of the single-phase AC power supply based on the timing detected by said timing detection unit, and the inverter input voltage value that is an output from said inverter input voltage detection unit at the timing detected by said timing detection unit.
8. (Previously Presented) A motor driving apparatus as defined in Claim 1, wherein

said rectifier circuit has a capacitor for charging a regenerative current from the motor.

9. (Previously Presented) A motor driving apparatus as defined in Claim 1, wherein said rectifier circuit has an inductor for cutting noise that occurs in said inverter circuit.

10. (Previously Presented) A compressor including a motor for generating a power, and a motor driving apparatus for driving said motor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

11. (Previously Presented) An air conditioner including a compressor having a motor for generating a power, and a motor driving apparatus for driving said motor of said compressor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

12. (Previously Presented) A refrigerator including a compressor having a motor for generating a power, and a motor driving apparatus for driving said motor of said compressor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

13. (Previously Presented) An electric washing machine including a motor for generating a power, and a motor driving apparatus for driving said motor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

14. (Previously Presented) An air blower including a motor for generating a power, and a motor driving apparatus for driving said motor,

wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

15. (Previously Presented) An electric vacuum cleaner including a motor for generating a power, and a motor driving apparatus for driving said motor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

16. (Previously Presented) An electric dryer including a compressor having a motor for generating a power, and a motor driving apparatus for driving said motor of said compressor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.

17. (Previously Presented) A heat pump hot-water supply unit including a compressor having a motor for generating a power, and a motor driving apparatus for driving said motor of said compressor,
wherein said motor driving apparatus is a motor driving apparatus as defined in Claim 1.